SCHOOL OF PUBLIC HEALTH

COLLEGE OF MEDICINE AND HEALTH SCINECE

UNIVERSITY OF GONDAR

PREVALENCE AND ASSOCIATED FACTORS OF DENTAL CARIES AMONG CHILDREN AT GONDAR TOWN NORTHWEST ETHIOPIA.

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Examiner

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List of acronyms

AOR-Adjusted Odds Ratio

COR- Crude Odds Ratio

DMFT-Decayed, Missed and Filled Teeth

HHs- House Holds

MOH- Ministry of Health

NGO-Non-Governmental Organization

SRS- Simple Random Sampling

UOG-University of Gondar

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Abstract : Dental caries is a disease with multifactorial causes. The prevalence and incidence of dental caries in a population is influenced by a number of risk factor such as sex, age, socioeconomic status, dietary patterns and oral hygiene habits. Thus the present study was designed to assess the prevalence of dental caries among children aged 7-14years in Gondar town.

Objective: the objective of this research was to assess the prevalence and associated factors of dental caries among Gondar town 7-14years age of children.

Methods: A community based cross-sectional study was conducted in Gondar town from June 2011 to September 2011 by using a pretested and structured questionnaire. After approval of the ethics committee, the parents were interviewed and children were clinically examined by using the same criteria established by world health organization. Multistage systematic sampling was used to select a total of 842 study subjects among 12 kebeles administrations of Gondar town dwellers. Data were entered and analyzed by using EPI info version 3.5.1 and SPSS 16.0 software. Binary and multiple logistic regression were ($p \leq 0.05$) applied for statistical analysis of data.

Results: Among the study subjects 463(55%) and 379(45%) were females and males respectively. The prevalence of dental caries was found to be 306(36.3%). The educational status of father (AOR=0.369(0.170, 0.803), monthly household income(AOR=0.0.59(0.008,0.447), tooth brushing(AOR=0.07790.030,0.201) and mouth rinsing(AOR=0.399(0.198,0.804) were found statistically significant. Consumption of sweet food/drink(AOR=1.914(0.908,3.626) was not significant.

Conclusions: A high prevalence of dental caries was observed in the present study. This prevalence of was associated with lower socioeconomic status, and poor oral hygiene practices. Caries prevention strategies on this population should include instructions of parents and community leaders about oral hygiene, dietary habits, and access to dental care services.

Key words; Children, dental caries associated factors.

1. INTRODUCTION

1.1 STATEMENT OF THE PROBLEM

Dental caries is among the most prevalent and costly diseases affecting both developed and developing countries, and yet it is highly preventable (1).

The distribution and severity of dental caries vary in different part of the world, and within the same country or region. A data base was established over a number of years and increasing number of epidemiological studies documented. A pattern of change in caries prevalence that is increasing in certain developing countries and decline observed in many developed countries (2).

The caries decline observed in many developed countries was the results of a number of public health measures, coupled with changing living condition, life style, and improved self care practice. The trends of dental caries in developing countries were increasing gradually. The explanation for this said to be the growing consumption of sugary substances, alcohol consumption, substance abuse, cigarette smoking, poor oral care practices and inadequate health service utilization(2).

Though great strides have been taken globally in the fight against oral diseases, problems still persist especially among poor, disadvantaged and socially marginalized communities. The situation is particularly severe in developing countries where the priority given to oral health is low because of budgetary constraints and a multitude of other pressing health problems (3).

In African countries oral health has started to deteriorate and currently it is expected that the incidence of dental caries will increase. About 90 % of dental lesions in African countries are untreated, and this reflects the minimum amount of dental treatment received by the population which may be explained by the current unfavorable dentist/ population ratio, inadequate facilities, and resources as well as poor dental health awareness in the general population(4).

. Majority of the population have no awareness about these problems. For example, the number of people who maintain an acceptable standard of oral hygiene is low in

addition; harmful traditional practices are still prevalent (5). No effective measures existed for preventing dental caries, and the most frequent treatment was tooth extraction .In Ethiopia oral disease and their treatment receive little attention and public health planning .. Therefore the present study attempts to assess the risk factor for dental caries among children (6).

Information about dental caries prevalence and severity forms the basis for caries prevention programs and treatment needs in population; therefore there is a continuous need for more studies about the prevalence and severity of dental caries. The present study will be carried out to determine the caries prevalence and associated factors among a group of Gondar town children. This research paper will fill the gap of oral health problems which are commonly seen in Africa, including Ethiopia, in particular Gondar town.

Dental caries is an infectious, transmissible bacterial disease; the most predominant bacterial species are streptococcus mutans and lactobacilli species, as in ordinary pattern of dental caries (Dental caries is one of the most prevalent chronic diseases in mankind worldwide. It is multifactorial disease that starts with microbiological shifts within the complex biofilm (dental plaque)) (7).

In children the caries attack pattern depends on three factors: the timing of the tooth eruption, the time span of the harmful dietary habit and the type of muscle movements during sucking and swallowing. Many authors reported that the attack pattern of the early childhood caries changes at age three, when it begins to affect the first and second primary molars (8, 9**).**

1.2 Literature Review

A comprehensive review of the epidemiology of dental caries in children showed that Its prevalence varies from one population to another (10).

Dental caries has been known throughout history but a sharp increase occurred in prevalence and incidence of the disease during the 1920s and 1950s, and it became recognized as a major health problem in some countries notably when demand for caries was increased in 1950s and early 1960s, and some countries recorded that almost no children were free from caries. Certain developing countries have reported an increase in dental caries in 1980s and the raising trend of caries incidence in developing countries accounted for 75 % of the world's population outweighed the opposite trends in the developed countries (11).

A study conducted in Egypt from children 496 boys and 503 girls had showed that dental caries prevalence was high among the study subjects (60.4%) with the mean dmf value 3.31±3.99. The results of this study showed that the prevalence of dental caries increases with age and there is no statistically significant difference between boys and girls. The sequence of caries attacks follows specific pattern where the right mandibles first primary molar had the highest caries percentage (36.5 %) then maxillary molars and maxillary anterior teeth and finally the left lower primary lateral incisor which exhibit the lowest caries percentage (1.0%) (13).

. A study in Cairo was done to investigate dental caries prevalence in 900 child with their age ranged from 3-12 years old. The mean DMF was 10.2 and it reached its maximum level at age 8-9 years old, the mean DMFT reached its maximum level at age 11-12 years (14).

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A study conducted in South African population tooth decay is widespread, but is also displays wide variation in prevalence and severity across communities, and the values for DMFT range from 5 to 32 (16).

A study conducted in Benguet, Philippines showed that 71.7and 68.2% prevalence of dental caries in primary and permanent dentition respectively, among school children aged 6-12years indicating a wide spread neglect of oral health in children, untreated, decayed teeth dominated the DMFT scoring among the children demonstrating a high rate of unmet treatment needs (17).

The 1958 Littleton's national survey had shown that its prevalence rate was low (23 %) and the majority of (77 %) population being free of dental caries as all studies agreed on an individual bases. However, the prevalence of caries in the population as a whole has increased recently (18).

A study conducted in Israel on Ethiopian immigrants had showed that, 57% of the participants reported a "bad" health status of their teeth, 56% reported a "bad" health status of their gums, and 60% reported that they suffered from tooth ache. This high level of reported tooth ache may have been due to the extremely low level of treated caries and possibly deep neglected lesions. Regarding the association between clinical examination findings and perceived oral health status, among the individuals with 3 or more teeth with untreated decay, 39% described the condition of their natural teeth as "poor". Nearly 75% of individuals with no untreated decay reported the condition of their natural teeth to be "good" (38%), "very good" (23%), or "excellent" (14%) (19).

In Ethiopia a survey of dental health conducted among 232 students in 6 campaign posts from three regions in 1976 showed that the DMFT rate was 53 % (49 %, 54 %, 65 % in age group of 15-19, 20-24, 25 years and over, respectively), only 37 (28.5 %) reported regular oral hygiene practice after at least two meals (20).

The mefakiya, or local twig brush, was the means most regularly used (86 %), only 9 students used tooth pastes. Thus for the age groups of 15-19 and 20-29 years, reported DMFrates of 14 % and 22 % respectively (12). While this study finding rates were 49 % and 61 % (for those 20 years and above). "There has been a steady increase in dental caries during most of recorded medical history (19).

The study done in Kimer Dingay North-Western Ethiopia, in 1985 indicates that the overall prevalence of dental caries was 47.1 %, the age group 20-29 years constituted the highest proportion, 16.7 %, and the males who had good oral hygiene only 18.6 %

were positive for dental caries, and of females with oral hygiene the percentage was 27.9 % with caries. With bad oral hygiene, the dental caries percentage was 61.1 % and 70.11 % for males and females respectively. Among those using the local tooth brush (mefakiya) made from a twig, 23.1 % were caries positive and the rest negative (21).

A cross sectional community based survey done in Shashemene Woreda in south eastern Ethiopia in 1994, on 1228 individuals showed the overall prevalence of dental caries to be 51.4% it beings higher among rural residents (53.7 %) than urban residents (46.4 %). Dental caries prevalence showed an increase with increase in age (22).

Factors affecting Dental Caries

Dental caries (decay) occurs when bacteria living in dental plaque ferment dietary carbohydrate, producing acid that lowers plaque PH. When the pH at the tooth surface falls, demineralization occurs, with calcium and phosphates diffusing out of the tooth enamel. Repeated exposure to reduce plaque pH results in sub-surface softening of the enamel, and the lesion can progress to form a carious cavity (23).

Development of caries is influenced by previous disease use of fluoride, plaque control, salivary flow, medical history and diet, which in turn are influenced by social factors.

The dietary factors include the amount of sugar consumed, sugar concentration of food, physical form of carbohydrate, oral retentiveness (length of time teeth are exposed to reduce plaque pH), frequency of eating meals and snacks, length of interval between eating and sequence of food consumption. In particular, the amount and frequency of consumption of non-milk extrinsic sugars are considered to be the major causes of dental caries in the United Kingdom (24).

Good oral hygiene is central to the strategy for improving children’s dental health. It is recommended that teeth require frequent brushing (at least twice a day) from an early age, and it has been suggested that frequent brushing (with a fluoride toothpaste) may have greater impact on the prevention of caries in young children than restricting sugary foods. There is a wide range of overlapping factors in the development of dental caries (23).

Previous disease

Past caries experience is the most powerful single predictor of future caries increment (but even so the power is modest). When screening for high caries increment in young children, caries in deciduous teeth is a better criterion than caries in permanent first molars (24).

Diet

Sugars are a major component of our daily diet. Children average nearly seven intakes of food per day, 11-13 many of which are snacks rich in added sugars. Although there are many risk factors for dental caries, the local effect of dietary sugars has a fundamental role in the disease.

Several dietary factors are associated with caries incidence:

- Amount of fermentable carbohydrate consumed
- Sugar concentration of food
- Physical form of carbohydrate
- Oral retentiveness (length of time teeth are exposed to decreased plaque pH)
- Frequency of eating meals and snacks
- Length of interval between eating
- Sequence of food consumption.

However, the key observation is that increasing the frequency of sugar intake increases the odds of developing dental caries, whilst lowering sugar intake can reduce it (24,25).

Social factors

Studies have demonstrated that dental caries is most prevalent in schoolchildren from low socio-economic status families. Children from these families show higher caries Prevalence, fewer caries-free teeth, fewer sealants and more untreated lesions. The WHO International Collaborative studies, have demonstrated a social gradient in adolescents' caries experience across high-and low income countries and various oral health care systems. Social- and in behavioral inequality in dental caries and periodontal diseases has also been identified comparative studies from sub Saharan Africa, South East Asian countries and Chile. Moreover, social disparities in

adolescents' oral health behavior have been demonstrated in developing countries and elsewhere, with oral health detrimental behaviors being most common in subjects of lower socio-demographic status (26).

Socio-environmental factors influence behavioral- and attitudinal factors which in turn impact on clinical- and subjective oral health outcomes. Socio-demographic factors, such as place of residence, age, gender, family income and education and individual factors in terms of oral health behaviors might influence oral health outcomes. Moreover, socio-demographic factors might influence oral health outcomes directly or indirectly through oral health related behaviors (4,25,26,27).

Bacterial plaque

It is one of the most important etiologic agent for dental disease it begins as a clear film that stick to tooth and is made up bacteria, salivary product and dead cells from the oral mucosa If it sticks and so food contains refined sugar are easily trapped in it the bacteria in the plaque broken dawn the sugar to form acid which combine with plaque to form acid plaque this attacks teeth to form cavities.

The amount and type of bacterial plaque formed is mainly related to two factors; the type of carbohydrate in the diet and the efficacy of oral hygiene measure. The organism in dental plaque will produce organic acids if certain sugars are eaten. The concentration and quantity of acids formed vary according to the type of sugar containing food eaten and the relationship of foods more than three times a day the hydrogen ion concentration of dental plaque will remain below PH 5.5 (27).

Fluoride

Fluoride has the ability to inhibit demineralization of the enamel and to enhance remineralization, that is, enhance repair by its presence in saliva and plaque. Further, fluoride has several antibacterial properties. Its concentration in plaque is sufficiently high to disrupt bacterial enzyme systems, thus resulting in less acid production and possible prevention of bacterial adhesion to the enamel surface.

Water fluoridation has been recognized as a significant method in preventing tooth decay since the 1930s.In areas where water fluoridation is not practical or desirable; fluoride supplements in the diet during the ages of tooth formation can provide

protection. Some countries make fluoridated salt available. Other countries depend only on the topical application of fluoride by a dentist or dental hygienist, or on mouth washes containing fluorides. However, water fluoridation remains the cheapest, most effective form of fluoride treatment (27).

Saliva

Saliva fulfils a major protective role against dental caries. A small group of children in this age group may have reduced salivary flow – usually as a consequence of their medical history and related drug therapy – and are at high risk of dental caries (27).

Medical history and disability

A range of factors in a child's medical history may be associated with increased caries risk. A learning disability is not, per se, a predictor of increased caries risk. However, a wide variety of physical and learning disabilities result in decreased ability to perform oral self-care. Learning disability is often associated with poor oral hygiene and frequent Consumption of sweet snacks. In this group of patients caries is often untreated and extraction rates are higher. Some disabled patients are resident in institutions where care givers are responsible for their oral hygiene (25, 28).

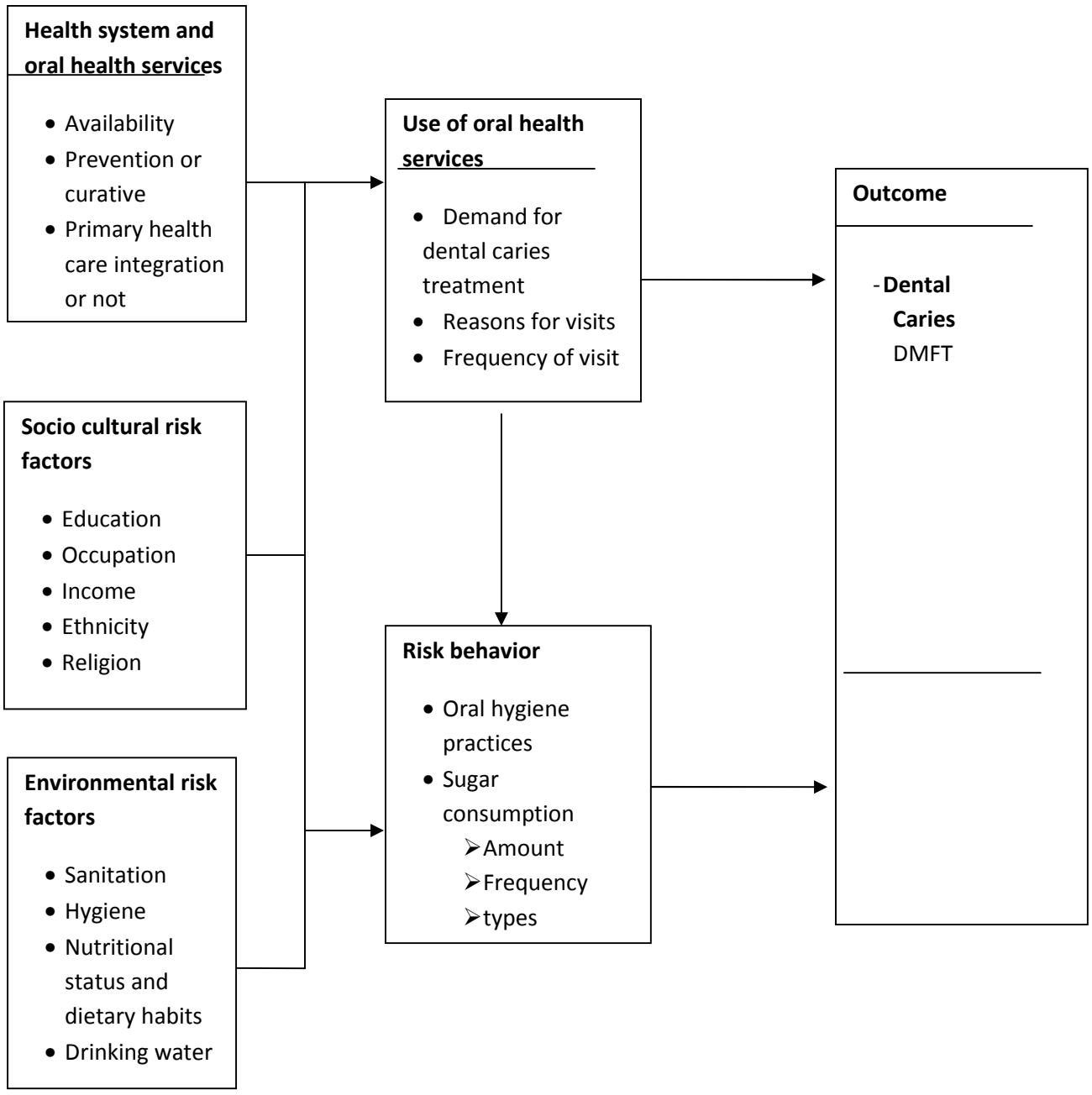

Figure 1: conceptual framework for dental caries.

1.3 JUSTIFICATION

1. Little is known about the disease status and factors influencing the occurrence of dental caries.

2. To prevent dental caries, scientific knowledge about changing the associated factors of the disease should be applied.

3 .This paper aims to address this gap by attempting to explore the factors.

4. The results of this paper may draw the attention of policy makers, NGOs and other stake holders.

2. Objectives

2.1 General objective

To assess the prevalence and associated factor of dental caries among children at Gondar town.

2.2 Specific objectives

- To determine the prevalence of dental caries among Gondar town children aged 7 -14 years.
- To identify associated factors of dental caries among Gondar town children aged 7 -14 years.

3. Methods

3.1 Study design and period

A community based cross-sectional study was conducted from May 2011 to July 2011 among Gondar town children to assess prevalence and associated factors of dental caries.

3.2 Study Area

The study was conducted in the historical Gondar town, which is 737 kilometers from Addis Ababa. Gondar town is one of the districts in the North Gondar administrative Zone, Amhara regional state with a total population of 231,977(29). The city is divided in to 12 urban kebele administrations, 12 rural kebeles.

3.3Source population

All children aged 7 to 14 years living in Gondar town were source population.

3.4 Study Population

Children from age 7 to 14 years in the selected Kebeles and ketenas were the study population.

Inclusion criteria

Children who were aged from 7-14 years and present during data collection days were included.

3.5 Sample size and sampling procedure

Sample size was calculated by using single population proportion formula Assumption for calculating the sample size:

- Confidence level, 95%
- 5% degree of precision
- There was a study conducted in south Gondar (kimir Dingaye) for estimation of proportion on the dental caries (47.1%) used (21).

$n = Z^2pq/w^2$

$n = (1.96)^2(0.471)(0.529)/(0.05)^2$

n = 383

With 10% non- response rate and design effect of 2, the final sample size became 842.

The study population was selected using multi-stage sampling technique; the total sample size was shared among all the 12 urban kebeles based on its current population size. Then, ketenas were selected from each kebele based on their sample size allocation by using simple random sampling. Every fifth house, only one household was considered. If there was no target child in the selected household the next home was considered. If there were more than two target children in a household only one child was selected by lottery method. Two data collectors were assigned for each kebele administration, one interviewer and recorder and one physical examiner.

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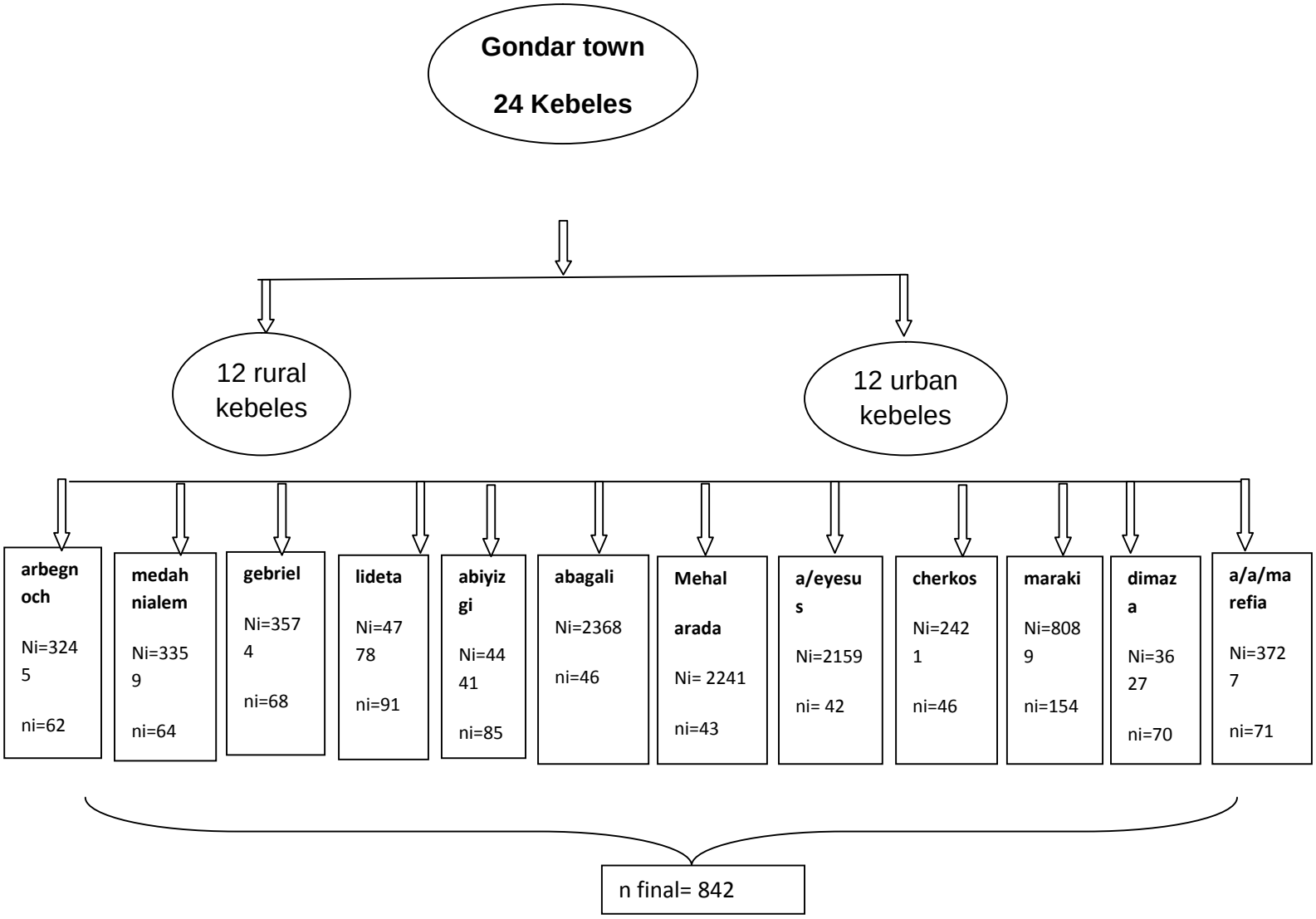
Figure 2: Schematic representation of sampling procedure



ni =Ni Xn where N =total number of households in 12 urban Kebeles (44029)

N Ni = total number of households in each Kebele

n =total sample size to be selected in12 Kebeles (842)

ni =sample size drawn from each Kebele

3.6 VARIABLES OF THE STUDY

Dependent variables: Dental caries

Independent Variables

- Socio-demography characteristic, including age, sex, ethnicity, religion, educational and marital status of parents and age sex and educational level of children.
- Dietary habit
- Oral care practice
- Socioeconomic factors
- Sources of information about dental caries
- Health care seeking behavior

3.7 OPERATIONAL DEFINITIONS (30)

- Clinical caries: is defined as a cavity diagnosed by visual examination/probing of the mouth
- Past caries: is manifested either by a filling or by loss of the tooth due to dental caries.
- DMF: index per person: it is average number of permanent teeth per person which are decayed (D), missing (M), and Filled (F).

0- Sound tooth:- a tooth is recorded as sound if it shows no evidence of treated or untreated clinical caries.

1- Filled tooth with decay: filled with decay when it contains one or more teeth.

2- Tooth missing due to caries: teeth that have been extracted because of caries.

3.8 Data Collection procedure

A structured questionnaire was used to assess socio-demographic characteristics, dietary habit, health care seeking behavior and oral care practice towards oral health among study subjects.

Diploma graduating class clinical nurses (12) data collectors and (3) supervisor Bachelor of Science nurses were trained on the data collection process

The questionnaire was first prepared in English and translated to Amharic and back to English for its consistency. The questionnaire was pre-tested among 42 children who were dwellers in non included ketenas.

Some modifications concerning clarification of the content and simplification of the wording was considered after the pre-testing of the questionnaire.

Dental Examination

Dental examination was carried out to all randomly selected children (842) to identify cases under field condition with an assistant recording the observation. Prior to the study, data collectors were given a brief reinforced training on dental caries assessment according world health organization recommendation by dental doctor at UOG referral hospital dentistry department to maintain uniform and standard dental assessment. During practical training Trainees had been given demonstration about physical examination on each other, then the next day, they had been exposed on real patient examinations. Antiseptic solutions, surgical gloves, probe, dental mirror and spatula were used during training sessions.

Caries was recorded as being present when a lesion in a pit or fissure or on smooth tooth surface had a detectable softened floor, undermined enamel or softened wall. A filled tooth also included in this category when it contains one or more restorations and one or more areas that are decayed. On proximal surfaces, the examiner should be certain that the explorer has entered a lesion. Where any doubt existed, caries was not recorded as present. Tooth was considered missing because of caries if a person gave

a history of pain and / or presence of cavity prior to extraction. The dental examination was done in day light, being a child sit on a chair Disposable wooden spatula were employed to assess carious lesion to confirm the presence of decay.

Diagnostic criteria for caries	**Type of diagnosis**
0-sound	normal
1-active caries (surface intact)	normal
2-active caries (surface discontinuity)	caries
3-active caries (cavity)	caries
4-inactive caries (surface intact)	normal
5-inactive caries (surface discontinuity)	normal
6-inactive caries (cavity)	caries
7-filling (sound surface)	filled
8-filling+active surface	filled with caries
9-filling+inactive caries	filled
X-extracted because of caries	lost because of caries

3.9. Data quality assurance

The quality of data was assured by properly designed and pre-tested of the questionnaire, proper training of the interviewers and supervisors of the data collection procedures, proper categorization and coding of the questionnaire. Everyday,10% of the computed questionnaires were reviewed and checked for completeness and relevance by the supervisors and principal investigator and the necessary feedback offered to data collectors in the next morning before the actual procedure.

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3.10 Data processing and Analysis

Data entry and clearing was done using EPI info version 3.5.1 statistical package, and analysis was made using SPSS statistical program. To compare factors of dental caries among study subjects, chi-square was employed and presented using the odds ratio and 95 % Confidence interval. Multiple logistic regression was used to control for confounding variables. Data were presented using tables and figures. Presence of association between outcome and independent variables was examined by using Odds ratio with 95 % Confidence interval and p-values.

Bivariate analysis was made between the dependent variable and each independent variable to determine whether association was present or not. Then characteristics or variables which have a p-value of <0.2 were entered into multiple logistic regression in order to control confounding factors. Back ward stepwise regression was used in the final analysis for adjusted odds ratio.

4. Ethical considerations

Ethical clearance was obtained from ethical IRB of the University of Gondar. Then, official letter was obtained from Gondar city Mayor office, then the Mayor office has written letter for each kebele administration and then each kebele administration wrote a letter for each data collectors. Confidentiality was secured, study subjects were told to withdraw at any time. Physical examination was done on voluntary bases. Health Education was given for study participants. Cases were referred to UOG referral hospital for appropriate treatment and services.

5. Results

5.1 Socio-demographic characteristics of study subjects

A total of 842 study subjects were included in the study after fulfilling the inclusion criteria, complete data were obtained from 842 study subjects, with a response rate was 100%. Out of which 306 (36.3%) were diagnosed to have dental decay and the rest 536(63.7%) were free of dental caries.

More than half of study participants 463(55%) were females and 379 (45%) were males. Five hundred and seven (60.2%) of the study subjects were in the age group between 7-10 years, with a mean 10.1 and standard deviation of 2.1 years.

Majority of the study subjects 727(86.3%) were from Amhara ethnic group and 692(82.2% were Orthodox Christians.

Large proportions of the parents 559 (66.4%) and 142 (16.9%) were married and divorced, respectively. Two hundred seventy three (32.4%) mothers were between grade 7 and 12 and 268 (31.8%) of fathers were above grade 12 in their educational status. Five hundred ninety three (70.4 %) and 249 (29.6%) of the children were 0-4 and 5-8 grade, respectively (table 1).

A very large number of the households 363(43.1%) earn below 500birr per month. Only 35(4.2%) of the study subjects earn greater than 3000ETB per month (table 1).

Table1. Socio-demographic characteristics of Gondar town children aged 7-14 years, NorthWest Ethiopia, September, 2011

Characteristics	Frequency	Percent
Age 7-10	507	60.2%
11-14	335	39.8%
Sex Male	379	45%
Female	463	55%
Ethnicity		
Amhara	727	86.3%
Tigrie	73	8.7%
Kimant	36	4.3%
Other	6	0.7%
Religion		
Orthodox	692	82.2%
Muslim	119	14.1%
Protestant	13	1.5%
Catholic	11	1.3%
Other	7	0.8%
Marital status of parents		
Married	559	66.4%
Single	25	3.0%
Divorced	142	16.9%
Widowed	116	13.8%
Educational status of mother		
Illiterate	234	27.8%
Can read and write	51	6.1%
1-6 grade	155	18.4%
7-12 grade	273	32.4%
>12 grade	129	15.3%
Educational status of father		
Illiterate	112	13.3%
Can read and write	94	11.2%
1-6 grade	125	14.8%
7-12 grade	243	28.9%
>12 grade	268	31.8%
Educational status of the child		
1-4	593	70.4%
5-8	249	29.6%
Monthly income of the house hold		
< 500	363	43.1%
501-1000	239	28.4%
1001-1500	66	7.8%
1501-2000	93	11%
2001-3000	46	5.5%
>3000	35	4.2%

Table2. Food consumption pattern and dietary habits of children aged 7-14years, Gondar town, North West Ethiopia, September, 2011.

characteristics	Frequency	percent
Frequency of meal		
Once per day	5	0.6%
Twice per day	43	5.1%
Three times per day	462	54.9%
Four times and above	332	39.4%
Type of food for breakfast		
Bread with tea	636	75.5%
Bread with milk	45	5.3%
Injera with wot	140	16.6%
Kinche	21	2.5%
Type of food for lunch		
Bread with tea and milk	22	2.6%
Injera with wot	799	94.8%
Kinche and pourage	21	2.6%
Snack frequency		
Three times per day	524	62.2%
Twice per day	34	4.0%
Once per day	197	23.4%
Occasional	87	10.3
Consumption of sugared tea		
Yes	739	87.8%
No	103	12.2%
Consumption of sugared coffee		
Yes	95	11.3%
No	747	88.7%
Consumption of soft drinks		
Yes	478	56.8%
No	364	43.2%
Consumption of sweet foods and drinks		
Yes	722	85.7%
No	120	14.3%
Frequency of sweet foods and drinks		
Daily	199	23.6%
Once per week	74	8.8%
Occasionally	449	53.3%

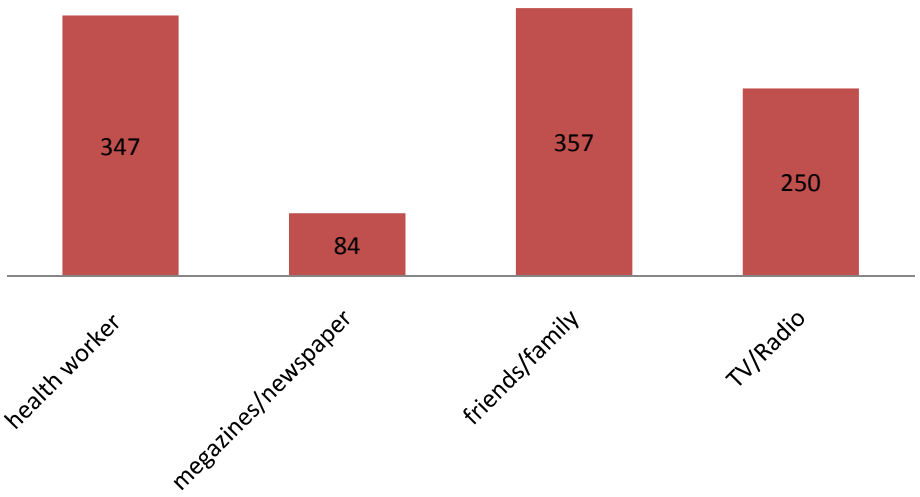

Figure 3- Source of information about dental caries among Gondar town study participants Northwest Ethiopia, September, 2011

Figure 4 place of treatment for dental caries among Gondar town study participants Northwest Ethiopia, September, 2011

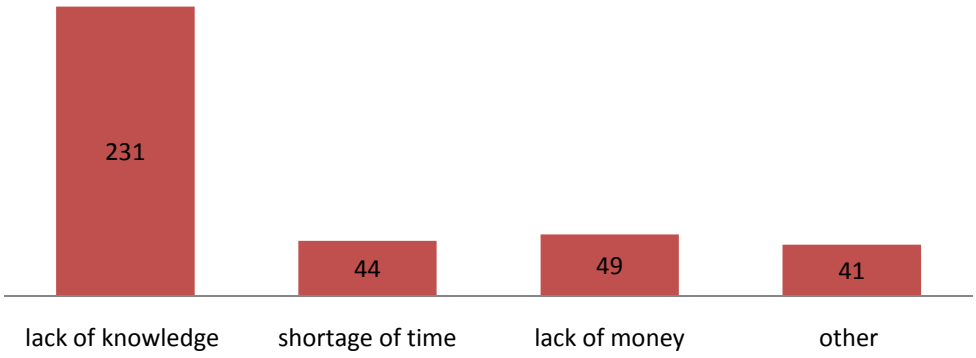

Figure 5 Reasons given for not tooth brushing among Gondar town children aged 7-14 years, Northwest Ethiopia, September, 2011

Table3.Oral care practice among Gondar town children aged 7-14years, Northwest Ethiopia, September 2011

Characteristics		frequency	percent
History of dental caries			
Yes	284	33.7%	
No	558	66.3%	
History of bottle feeding			
Yes	217	25.8%	
No	625	74.2%	
Tooth brush			
Yes	477	56.7%	
No	365	43.3%	
Frequency of tooth brush			
Once per day	189	38.8%	
Twice per day	67	12.4%	
Some times	221	48.8%	
Rinsing mouth with water after meal			
Yes	756	89.8%	
No	86	10.2%	
Tooth flossing			
Yes	21	2.5%	
No	821	97.5%	

5.4- Dental caries

All types of decayed teeth were 306(36.3%), incisors total decayed 53(6.3%), canines total decayed44 (5.3%), premolar decayed 105(12.5%) and molar total decayed172 (20.4%). All type of missed teeth was 135 (16.0%). Incisors total missed 18(13.33), canine total missed 32(23.71%), premolar total missed 41(30.37%) and molar total missed were 44(33.33%).No filled cases were reported at all (table 4).

Table4- Dental cases of Gondar town children aged 7-14years, Northwest Ethiopia, September, 2011.

Characteristics	Frequency	Percent
Decayed teeth (all types)		
Yes	306	36.3%
No	536	63.7%
Incisors total decayed	53	17.3%
Canines total decayed	44	14.4%
premolars total decayed	105	34.3%
Molar total decayed	172	56.2%
Missed teeth (all types)		
Yes	135	16.0%
No	707	86.0%
Incisors missed	18	13.33%
Canines missed	32	23.71%
Premolars missed	41	30.37%
Molars missed	44	33.33%

NB. Total decayed teeth (306) were not equal to the sum of each type of decayed tooth because one child could have more than one decayed tooth.

5.5. Factors associated with dental caries

According to the bivariate analysis a few socio demographic variables, ethnicity, educational status of father , monthly household income, consumption of sweet foods, tooth brush, mouth rinsing, reasons .Based on the multiple logistic regression analysis, there was statistically significant association between dental caries and educational status of father. The likelihood of having dental caries among study subjects who were above grade 12 were found to be at a lower risk compared to illiterates [(AOR=0.369, 95%CI 0.170-0.803)]. But there was no difference in prevalence of dental caries among the other educational levels compared to illiterates.

The likelihood of having dental caries was lower among study subjects who were earning greater than 3000birr per month as compared to those earn less than 500birr per month [(AOR=0.059,95%CI(0.008-0.447)]. However, there was no statistically significant association between dental caries and ethnicity. The likely hood of having

dental caries among the study subjects who had cleaned their teeth were less when compared to those who did not clean.[(AOR=0.0779, 95%CI (0.030-0.201)].

The odds of having dental caries was also lower in study subjects who have been rinsing their mouth after meal as compared to those do not rinse [(AOR=0.399,95%CI(0.198-0.804)]. But there was no significant difference between dental caries and consumption of sweet foods /drinks among the study participants [(AOR=1.814, 95%CI (0.908-3.626)] (Table8).

Table 5: Factors associated with dental caries among Gondar town children aged 7-14years, Northwest Ethiopia, September, 2011

Characteristics	Decayed teeth		COR (95 % CI)	AOR (95 % CI)	p- value
	Yes	No			
Ethnicity					
Amhara	272	455	1.00	1.00	
Tigray	23	50	0.769 (0.459 ,1.289)	0.705(0.328, 1.517)	
Kimant	7	29	0.404 (**0.175 ,0.934)**	0.627(0.075, 1.947)*	
Other	4	2	3.346 (0.609 ,18.38)	1.092(0.142, 8.401)	
Educational status of father					
Illiterate	44	68	1.00	1.00	**0.012**
Read & write	38	56	1.049 (0.599,1.836)	1.185 (0.508,2.766)	
1-6grade	54	71	1.175 (0.700,1.974)	1.378 (0.615,3.088)	
7-12grade	95	148	0.992 (0.627,1.569)	0.894 (0.436,1.833)	
>12grade	75	193	0.601 (**0.378,0.955)**	0.369 **(0.170, 0.803)***	
Monthly income					
< 500	157	206	1.00	1.00	**0.006**
501 – 1000	93	146	0.836 (0.599,1.166)	0.875 (0.51, 1.486)	
1001 – 1500	20	46	0.570 (0.324,1.003)	1.291 (0.564, 2.955)	
1501 – 2000	24	69	0.456 (**0.274,0.759)***	0.628 (0.307, 1.286)	
2001 – 3000	8	38	0.276 (**0.125,0.609)***	0.521 (0.175, 1.527)	
>3000	4	31	0.169 (**0.059,0.490)***	0.06 **(0.01, 0.45)***	
Snacking frequency					
Three times/day	178	346	0.729 (0.459,1.158)	1.366(0.613, 3.045)	
Twice/day	11	23	0.678 (0.294,1.563	1.251(0.326, 4.791)	
Once/day	81	116	0.989 (0.0.593,1.651)	1.018(0.429, 2.417)	
Occasional	36	51	1.00	1.00	
Consumption of sweet foods/drinks					
yes	282	460	1.941(1.199,3.144)	1.814(0.908,3.626)	
No	24	76	1.00	1.00	
Consumption of soft drinks					
yes	175	303	1.027 (0.774,1.364)	0.859(0.449, 1.643)	
No	131	233	1.00	1.00	
Tooth brushing					
yes	165	312	0.84(0.54,0.97)	0.077 **(0.030-0.201)**	**< 0.001**
no	141	224	**1.00**	**1.00**	
Mouth rinsing					
Yes	260	496	1.00	1.00	**0.010**
No	46	40	0.46 (**0.291,0.715)**	0.399 **(0.198-0.804)**	
History of dental caries					
Yes	224	60	21.67(14.98, 31.34)	1.026(0.714, 1.871)	
No	82	476	1.00	1.00	

*** Significant at p<0.05**

6. Discussion

This study has attempted to assess the prevalence and associated factors of dental caries among 7-14 years old Gondar town children. A total of 842 study subjects were included in the study. According to the clinical examination the prevalence rate of dental caries was 36.3% and the rest 63.7 were caries free. This prevalence was more or less similar with a study that was conducted among a cohort of Ethiopian immigrants to Israel, 29.9% (19). But this study was lower than a study done in kimer Dengay 1985 E.C (47.1%) (21).The reason for the difference of the prevalence rate could be a difference in methods and instruments used in the two studies and it could be also as a result of the differences in terms of the reference periods and questions and a result of improved oral health. Low prevalence of tooth decay in Ethiopia is also could be due to the traditional Ethiopian diet contains little sugar and other refined foods.

Greater than fifty percent of study participants 463(55%) were females and 379 (45%) were males. No statistical significant difference was found between values of boys and girls. Five hundred and seven (60.2%) of the study subjects were in the age group between 7-10 years, with a mean 10.05 and standard deviation of 2.12 age of year. As age increases, the prevalence of tooth decay also increases. This result is consistent with other studies, which describe the fact that, as the age increases, the time that the teeth subjected to carcinogenic food will also increase which may raise the possibility for decay (13).

Majority of the study subjects 727(86.3%) were from Amhara ethnic group and 692(82.2% were orthodox Christians. There was not statistically significant association between dental caries and ethnicity. Large proportions of the parents 559 (66.4%) and 142 (16.9%) were married and divorced, respectively. Religion, marital status, and sex, were not found to be associated with dental caries because they may not directly influence the occurrence of dental caries, rather it might be the individual behavior, habit and practice that has an effect on the development of dental caries.

Two hundred seventy three (32.4%) mothers were between grade 7 and 12 and two hundred sixty eight (31.8%) of fathers were above grade 12 in their educational status

There was no significant association between dental decay and mother's educational level which is not in agreement with a study conducted in Scotland which says that the children of the mothers with a high level of education are reported to have lower level of dental caries (31).

But, there was a statistical significant difference in different levels of educational status of father and dental carries similar research done in Scotland described that, as the education level of the father increases depending on the occupation, the dental caries and results are reduced. There is a negative correlation between them (31).

Another similar study conducted in Thailand reported that father level of education had some effect on dental caries development among children (32).

A very large number of the households 363(43.1%) earn below 500birr per month. Only 35(4.2%) of the study subjects earn greater than 3000birr per month. There was statistically significant difference between monthly income of the households and dental caries, as income increases ,they are less likely to be affected by dental decay, this could be elaborated by the reason that, households which have better monthly income can have opportunity to buy tooth cleaning materials, easy access to technology and better health care services. A study which was conducted in Toronto, Canada revealed that households that are with low monthly income were found to be more affected by tooth decay (33).

The evidence from Uganda revealed that a complex interaction of socio-demographic, behavioral and microbiological factors is responsible for the occurrence and development of dental caries generally and children in particular .Assessing of socio-economic status in terms of international classifications of occupational status is not easily applied in Africa. The higher caries prevalence observed among children from deprived schools in Nakawa (Uganda) and among those who have mothers with a lower level of education is consistent with findings from industrialized as well as non-industrialized countries. The current and the Ugandan result differ, from other studies in sub-Saharan Africa, where caries has been documented as being significantly worse

among children from a higher socio-economic background. Less-affluent people probably experience financial, social and material disadvantages that compromise their ability to care for themselves and to live in a healthy environment, thereby leading to a reduced resistance to oral and other diseases (34).

Another study that was conducted in Sao Paulo Brazil had showed that a high prevalence of childhood dental caries was associated with a lower economic classification. Economically deprived individuals living under less deprived social and environmental conditions usually have a poorer health behavior and are therefore to oral diseases (35).

Type and, frequency of meal, and Five snacking frequency have no significant difference in the development of dental caries. In the current study, frequency of snacking was not significantly associated with development of dental caries (P=0.35).A similar study done in India had revealed that, among the persons studied with different dietary habit, they found the highest number of caries patients with vegetarian dietary habit (P=0.856) followed by vegetarian plus tobacco user (P=0.077) and non vegetarian (Mixed diet) (P=0.067), respectively. It has been verified that dental caries is a process due to formation of acid by fermentation of sugar through acidogenic bacteria that lead to decalcification of dental enamel. But this acid is usually neutralized with the buffering action of saliva and the dental caries is prevented. When fermentable carbohydrate was not added to the saliva, putrefaction replaced fermentation, alkalinity replaced acidity, and no decalcification is usually observed. Putrefaction is the result of protein consumption, so it might be suggested that the persons who consume plenty of protein rich food in comparison to sugar, will develop less amount of acid in their mouth and relatively be protected from dental caries. It might be the reason for less number of cases among the non vegetarian (Mixed diet) population (15).

But, this is in contrary with a research conducted in Sudan which describes the association between sugar consumption and caries was significant at a national level. A substantial caries decline among Norwegian children during World War II (35%) was related to a restricted sugar intake and variation in caries scores in the Sudan has been

ascribed to differences in consumption of sugar. Another study that had been conducted in Nigeria showed that, there was significant association between dental caries and sweet food consumption. The possible explanation for this difference could be the availability, amount, and frequency of sweet food consumption may differ in different socio cultural back grounds of the nations (36,37,38).A Scottish research had explained that Consumption of sugar has long been seen as a cause of caries within a multifactorial context. Caries increment was significantly associated with the weight of sugar consumed, although the correlation coefficient was small (31).

The study that had been conducted in USA revealed that there were no association between tooth decay and consumption of sweetened foods and soft drinks. The discrepancy could be attributable to the grouping of sweetened beverages, methods used to assess beverage intake, inability to control for known confounders and the time period of beverage intake assessment relative to the disease process (12).

Below fifty percent of parents 347(41.2%) have got information on dental caries from health workers, and eighty four (10.0%) from magazine and news papers. Three hundred fifty seven (42.4%) and two hundred fifty (29.7%) have received information from friends/family and TV/radio, respectively.

.In this study, there was a strong positive association between caries development and tooth brushing practice. A similar research that was conducted in Scotland have showed that tooth brushing is associated with significantly reduced risk of caries. The more frequent brushing is performed, the less caries children experience (31).

Majority of the children practice tooth brushing, but the incidence and prevalence of dental decay is still increasing. This could be due to inadequate brushing time, type and quality of toothpaste, ineffective brushing technique or both factors. It was also possible that some of the children did not brush as they claim. Data collected by questionnaires might have limitation. Over reporting are possible regarding desirable outcomes like the frequency of tooth brushing and dental visits while consumption of sweets can be under reported.

Frequency of tooth brushing has not significant d difference with tooth decay. This is in agreement with a study done in Thailand (32).

Mouth rinsing was significantly associated with caries; individuals that rinse their mouth with water after meal were less likely to be attacked by dental caries than those who did not rinse. This could be due to the washing away of sugary food substances from the teeth; therefore, micro-organisms cannot get enough time for multiplication and growth and no acid production that causes caries development.

Molars (20.4%) and premolars (12.5%) were the most frequently affected teeth by dental caries. The reason could be majority of the food is grinded with these teeth and both of them have very large surface area in which the food particles accumulated and can serve as a growing media for micro-organisms. Therefore, these acid producing bacteria might affect the enamel of the tooth which later went into decayed teeth. On the other hand the canines (5.3%) and incisors6.3%) had the lowest decayed percentage among the four types of teeth, this is explained by the fact that both of them are protected from direct exposure to acidic food by the tongue and less chance chewing food materials, also they are close to the sublingual salivary gland duct where it helps in diluting the acidic environment around the lower incisors.

7. Strength and Limitations of the study

7.1 strength of the study

The data collectors were trained by dental doctors in dental clinic with practical demonstrations.

7.2. Limitation of the study

1. No radiological examination at field level.

2. Frequency, amount and the duration of intake of sweet food items and drinks was not well assessed.

3. Respondents have reduced their monthly income.

4. Recall bias and diagnostic bias

8. CONCLUSION

Prevalence of dental caries was higher as compared to a similar research that was conducted in Nigeria and lower than a study which was done in Egypt.

Tooth cavity was associated with lower socioeconomic status, lower father's educational level and poor oral hygiene practices. Caries prevention strategies on this population should include instructions of parents about oral hygiene, dietary habits, in addition to access to dental care services.

9. Recommendations

. **Health institutions**

- Provide school health services to Gondar elementary schools.
- Increase community awareness through Health education

Health and education offices

- Increases community awareness through IEC
- Promote oral hygiene
- Dietary advice of children to reduce sugary food substances
- Encourage local income generating activities at community level

Researchers/scholars

- Further research Is needed.

3. References

1. Marsh PD. Are Dental Diseases Examples of Ecological Catastrophes? Microbiology. 2003; 149: 279-294.
2. World Health Organization. Prevention Methods and Program for Oral Diseases WHO Technical Report Series 713. Geneva; WHO 1984.
3. Poul EP. World oral health report 2003: Continuous improvement of oral health in the 21st century-the approach of the WHO Global Oral Health Programme. J Comm. Dentistry Oral epidemio. 2003; 31: 3-24.
4. World Health Organization. WHO Oral Health Country/Area Profile. Available on the Internet from: http://www.whocollab.od.mah.se/index.html.
5. Stretton- Downes, S. Dental Health. In: kloos, H., and Zein A.Z (eds). The Ecology of Health and Diseases in Ethiopia .Oxford: Western Press. 1993 pp. 463-71.
6. Klein H. Dental status and dental needs of young adult males rejectable or acceptable for military services, according to Selective services dental requirements. Pub Health Rep. 1941; 56:136-87.
7. Selwitz R., Ismail A. and Pitts N. Dental caries. The Lancet. 2007; 369: 51-59.
8. Brodeur J.M, Galarneau C. The High Incidence of Early Childhood Caries in Kindergarten-age Children. Journal of College of Dentists of Quebec. 2006; Supplement 6.
9. Hallett KB, O'Rourke PK. Pattern and severity of early childhood caries. Community Dent. Oral Epidemiol. 2006; 34: 25–35.
10. Kaste LM, Marianos D, Chang R. Phipps and its relationship to high caries in the permanent dentition. J. Public Health Dent. 2008; 52: 64-68.
11. World Health Organization. Educational Imperatives for Oral Health Personnel change or decay? WHO Technical Report Series 794 General WHO 1990.

12. World Health Organization Global Oral Health Data Bank: Geneva: World Health Organization, 2002.
13. El-Yazeed M, Rashed M, El sayed M, Salah A. Dental Caries Prevalence among a group of Egyptian Nurseries Children. Life Science Journal. 2011; 8(1):512-519.
14. Manal E. Caries pattern in a group of Egyptian nursering and primary school children. Master Thesis in Pedodontics, Faculty of Oral and Dental Medicine Cairo University, 1996.
15. Khan A, jain K, Shiravastav A. Prevalence of dental caries among the population of Gwalior (India) in relation of associated factors. Eur J Dent. 2008; 2: 81–85.
16. Steyn N.P, My burgh NG and. Nel JH. Policy and Practice Evidence to Support a Food–Based Dietary Guide on Sugar Consumption in South Africa. Bulletin of the World Health Organization. 2003; 81(8): 601-602.
17. Ybao RN, Duante CA, Velandria FV, Lucas M, Kassu A, Nakamori M, et.al. Prevalence of dental caries and sugar consumption among 6-12-year-old school children in La Trindad Benguet, Phlilippines. European Journal of clini nutrition. 2005; 59: 1429-1438.
18. Littleton N. Dental caries and periodontal diseases among Ethiopian civilians. Public Health Reports. 1963; 78(7): 631- 643.
19. Vered Y**,** Zini A**,** Livny A**,** Mann J**,** Sgan-Cohen H. Changing dental caries and periodontal disease patterns among a cohort of Ethiopian immigrants to Israel; 1999-2005. BMC Public Health. 2008; 8**:**345.
20. Yayehyirad. K, Asmelash. G, Bedru. B: Dental Health Condition of Students in Ethiopia; A finding from the development through cooperation campy. Ethiop. Med .J. 1982; 20(9): 1967 – 77.
21. Okubagze J. Epidemiology of Dental Caries in a rural High land community North West Ethiopia; Ethiop. Med. J. 1987; 25(127).
22. Amdemichael, G. Prevalence and Determinant Factors of Dental Caries in Shashemene Woreda (MPH Thesis), Addis Ababa: University of Addis Ababa, 1995.

23. Scottish Intercollegiate Guidelines Network. Preventing Dental Caries in Children at High Caries Risk: Targeted Prevention of Dental Caries in the Permanent Teeth of 6–16 Year Olds Presenting for Dental Care. SIGN Publication no. 47. Edinburgh: Scottish Intercollegiate Guidelines Network, 2000.
24. Department of Health. Dietary Sugars and Human Disease. Report on Health And Social Subjects: 37. London: HMSO1989.
25. Seppa L, Hausen H, Pollanen L, Helasharju K, Karkkainen S. Past caries recordings made in Public Dental Clinics as predictors of caries prevalence in early adolescence. Community Dent Oral Epidemiol 1989; 17: 277-81.
26. Stecksen-Blicks C, Gustafsson L. Impact of oral hygiene and use of fluorides on caries increment in children during one year. Community Dent Oral Epidemiol 1986; 14: 185-9.
27. Mazengo MC, Tenovuo J, Hausen H. Dental caries in relation to diet, saliva and cariogenic microorganisms in Tanzanians of selected age groups. Community Dent Oral Epidemiol 1996; 24: 169-74.
28. French AD, Carmichael CL, Furness JA, Rugg-Gunn AJ. The relationship between social class and dental health in 5-year-old children in the North and South of England. Br Dent J. 1984; 156: 83-6.
29. FDRE population census commission. Summary and statistical report of the 2007 population and housing census. Addis Ababa: FDRE population census commission; 2008. Available from: CSA
30. Gonzalez MC, Ruiz JA, Fajardo MC, Gomez AD, Moreno CS, Ochoa MJ, et.al. Comparison of the def Index wit Nyvad's caries diagnostic criteria in 3-and 4-year-old Colombian children. Pediatrics dent. 2003; 25: 132 – 136.
31. Masson LM, Blackburn GA, Sheehy C, Caig LC, Macdiamid JI, Holms BA et al. Sugar intake and dental decay; results from a survey of children in Scotland. British Journal of Nutrition. 2010;104: 1555-1564.
32. Petersen P, Hoerup N, Poomviset N, Prommajan J, Watanapa A. Oral health status and oral health behavior of urban and rural school children in southern Thailand. International Dental journal.2001; 51: 95-102.

33. Al-Jewair TS,Leake JL. The prevalence and risks of early childhood caries in Toronto, Canada. J Contemp Dent Pract. 2010; 11(5): 1-8.

34. Kiwanuka SN, Astrom PN, Trovik TA. Dental caries experience and its relatiomship to social and behavioral factors among 3-5-year-oldchildren in Uganda. International journal of paediatric Dentistry. 2005; 14(5): 336-346.

35. Tiano A, Moimaz S, Saliba O, Saliba N. Dental caries prevalence in children up to 36 months of age attending day care centers in municipalities with different water fluoride content. J. Appl. Oral Sci. 2009; 17(1).

36. Birkeland J. Ibrahim Y. Ghandour I. Haugejorden O. Severity of dental caries among 12-year-old Sudanese children with different fluoride exposure. Clinical oral Invest. 2005; 9: 46-51.

37. Toverud G. The influence of war and post-war conditions on teeth of Norwegian school children. Milbank Mem Fund Q. 1957; 35:127–196.

38. Adekoya-Sofomora CA, Nasir WO, Oginni AO, Taiwo M. Dental caries in 12-year-old suburban Nigerian school. Afr Health Sci. 2006; 6(3): 145–150.

12. ANNEXES

12.1 Consent Statement

Hello. My name is _____and I am part of a research team of University of Gondar.We are collecting information on the prevalence of dental caries and associated factors among Gondar town children. We would very much appreciate your participation in this effort. Whatever information you provide will be kept strictly confidential. We will record your name on the questionnaire. However, your name will not be identified in any output of this study. Participation in this study is voluntary and you can choose not to answer any individual question or all of the questions. You may also stop the interview completely at any time without any consequences at all. However, we hope that you will participate in this study since the results will help the government dental caries control efforts.You have full right to withdraw from this study at any time without a need to mention the reason why you wanted to withdraw. We value your input to make this study a successful one. If you have questions about the research please contact Mr.Fenta Abebaw, who is principal investigator of this study in the University of Gondar, at +251(0)918788995. At this time , do you want to ask me anything about the purpose or content of this interview?

Thank you,

Remarks: Mark an “X” on the appropriate response.

Request accepted and Consent Given_____

Rejected the request_____

Interviewee Name _____Signature: _____Date _____

Name of witness_____Signature:_____Date_____

Name of field worker_____Signature: _____Date _____

12.2 English Questionnaire

Date_____

Identification .No ____

Section-1 A .Socio demographic Information			
S. No	Question	Option/ answers	Code
101	Age of the child	[ ] [ ]	
102	Sex	1.male 2. female	
103	Ethnicity (parents)	1. Amhara 2. tigray 3. quemante 4. agew 5. Others (specify)……..	
104	Religion (parents)	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Other (specify)……..	
105	Marital status of parents	1. Single 2. Married 3. divorced 4. widowed	
106	Educational status of mother	1. illiterate 2. writing and reading 3. 1-6 grades 4. 7-12 grades 5. Above 12 grades	
107	Educational status of father	1.illiterate 2.writing and reading 3.1-6 grades 4.7-12 grades	

		5.Above 12 grades	
108	Educational status of the child	……	
109	Monthly family income	……..	
Section 2- information on food habits			
201	Frequency of meals of your children	1. Once per day 2. Two times per day 3. Three times per day 4. Four times or more per day	
202	What type of food do you give usually for breakfast for your child?(for the last one month) (Circle that apply)	1. Bread with tea 2. Injera /wot or firfir/ 3. Kinchie 4. Pourage 5. Other (specify)…….	
203	What type of food do you give usually for lunch for your child?(for the last one month) (Circle that apply	1. Bread 2. Injera /wot or firfir/ 3. pasta 4. Kinchie 5. Pourage 6. Other (specify)…….	
204	What type of food do you give usually for dinner for your child?(for the last one month) (Circle that apply	1. Bread 2. Injera/wot or firfir/ 3. pasta 4. Kinchie 5. Pourage 6. Other (specify)…….	
205	Snacking frequency of your children	1. About 3 times a day or more 2. 2 times a day or more 3. About once a day 4. Occasionally not every day 5. Rarely or never eat between meals	
206	Does your child drink sugared tea?	1. yes 2. No	

207	If yes, how many caps of tea does your child drink in a day?	Number of caps _____	
208	Does your child Drink sugared Coffee?	1. Yes 2. No	
209	If yes, how many caps of Coffee do you drink in a day?	Number of caps _____	
210	Does your child take soft drinks?	1. Yes 2. No	
211	If yes, how many soft drinks does he/she drink in a week?	Number of caps _____	
212	Does your child eat sweet food staff like Cake, Cookies, honey and Others?	1. Yes 2. No	
213	If yes, how many times does the child take in a week?	1. Daily 2. 2-3days in a week 3. Once a week 4. sometimes 5. others_____	

Section 3: - Knowledge and practice about dental caries and its Prevention			
301	Have you ever heard of dental caries?	1. Yes 2. No	
302	If yes, where do you get the information?	1.health worker 2.Tv/radio 3.teachers 4.newspapers and books 5.others(specify)	
303	Have your children ever have dental caries?	1. Yes 2. No	

304	What are the major symptoms/ problems encountered? (Circle that apply)	1. Sever pain 2. Bad smelling 3. Bleeding 4. Swelling 5. Don't know	
305	If your child have dental ache, where did you go?	1. To a health institution 2. To a pharmacy 3. To traditional healer 4. No where 5. Other (specify)____	
306	If you take to health institution what was your reason to visit the dentist?	2. For tooth extraction 3. For tooth filling 4. For cleaning teeth 5. For reliving pain 6. Others (specify)___	
307	If yes, how many times per day?	1. Once a day 2. Twice a day 3. Several times per week 4. Less often	
308	Does your child have mouth-rinsing habit after food?	1. Yes 2. No	
309	Do you think dental checkups are important	1. Yes 2. No	
310	If the above questions are yes what are your reasons	1. to have teeth checked for cavities 2. to prevent toothache 3. for good oral hygiene 4. to prevent bad breath 5. to maintain or improve teeth appearance	
311	Do you have regular checkups for your children	1. yes 2. no	
312	If yes at what period do you visit	1. every six month 2. every year 3. less often	

313	If for qn number 316 “no” what are the main reasons	1. I do not know 2. I cannot afford 3. I forgot to go 4. I have no time to go 5. Nothing wrong with my child 6. Other reason please specify……	
314	Does your child floss his/her teeth	1. Yes 2. No	
315	If yes how many times	1. Once per day 2. Once per week 3. Two or more times per day 4. Two to three times per month	

ጎንደር ዩኒቨርሲቲ

ህክምናና ጤና ሳይንስ ኮልጅ

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በጎንደር ከተማ በሚገኙ ህፃናት ላይ የጥርስ መቦርቦር በሽታና ምክንያቶች ለማጥናት የተዘጋጀ መጠይቅ፡፡

<u>የስምምነት ቃል</u>

ጤና ይስጥልኝ፡፡ ስሜ_____ነው::የጎንደር ዩኒቨርሲቲ ተማሪ ነኝ፡፡ በጎንደር ከተማ በሚገኙ ህፃናት ላይ የጥርስ መቦርቦር በሽታና ምክንያቶች በተመለከተ መረጃ እንሰበስባለን፡፡ በምናደርገው ጥናት ውስጥ የእርስዎ ተሳትፎ በእጅጉ አስፈላጊ ነው፡፡ የሚሰጡት መረጃ ሁሉ ሚስጢራዊነቱ የተጠበቀ ይሆናል፡፡ ስም የሚመዘግብ ቢሆንም ከጥናቱ ውጤት ጋር ተያይዞ የሚገለፅበት ሁኔታ በፍፁም አይኖርም፡፡ የሚያደርጉት ተሳትፎ በፍቃደኝነት ላይ የተመሰረተ ስለሆነ ከሚቀርቡልዎ ጥያቄዎች አንዱን መርጠው ወይም ሁሉንም አለመመለስ ይችላሉ፡፡ በማንኛውም ጊዜ ቃለ-መጠይቁን ሙሉ በሙሉ ማቋረጥ ይችላሉ፡፡ ይህን ጥናት ስኬታማ ለማድረግ ለሚሰጡን ግብዓት ከፍተኛ ግምት እንሰጣለን፡፡ይህን ጥናት በተመለከተ ምንም አይነት ጥያቄ ቢኖርዎ ዋናውን ተመራማሪ አቶ ፈንታ አበባውን በዚህ ሞባይል ስልክ ቁጥር 0918-78-89-95 ይጠይቁ፡፡እንግዲህ የዚህን ቃለ-ምልልስ ፉይዳ ወይም ይዘት በተመለከተ ጥያቄ ለመጠየቅ ይፈልጋሉን? በጣም አመሰግናለሁ፡፡

<u>ማስታወሻ</u>፡- በተገቢው መልስ ላይ የ 'X' ምልክት ያድርጉ

- ጥያቄውን ለመመለስ ተስማምተዋል _____
- ጥያቄውን አልተቀበሉም _____
  ጥያቄውን ካልተቀበሉ ያልተቀበሉበትን ምክንያት በመጻፍ ወደሚቀጥለው የጥናት ተሳታፊ ይለፉ፡፡_____
  _____

- የመስክ ሰራተኛው ስም _____ ፊርማ_____ ቀን _____
- ቃለ-መጠይቁ የተደረገበት ቀን_____የተጀመረበት ሰዓት_____የተጠናቀቀበት ሰዓት_____

የመጠይቁ ውጤት፡- 1. ተጠናቋል 2. ተጠያቂው አልተገኘም 3. ተጠያቂው ፈቃደኛ አይደለም 4. አልተሟላም

ያረጋገጠው ተቆጣጣሪ ስም_____ ፊርማ_____ ቀን _____

አመሰግናለሁ!!

12.3 የአማ ርኛ መጠይቅ

ክፍል አንድ- ማህበራዊና ስነ ህዝባዊ መረጃ			
ተ ቁጥር	መጠይቅ	መልስ	ኮድ
101	የልጅዎት እድሜ ስንት ነው	..... አመት	
102	የልጁ ፆታ	1. ወንድ 2. ሴት	
103	ብሄር	1. አማራ 2. ትግሬ 3. ቅማንት 4. ሌላ ካለ ይገለፅ.....	
104	ሃይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይገለፅ.....	
105	የወላጅ የጋብቻ ሁኔታ	1. ያገባ 2. ያላገባ 3. የፈታ 4. የሞተበት	
106	የወላጅ እናት የትምህርት ደረጃ	1. ያልተማረች 2. ማንበብና መፃፍ 3. 1-6 ክፍል 4. 7-12 ክፍል 5. ከ12 ኛ በላይ	
107	የወላጅ አባት የተምህርት ደረጃ	1. ያልተማረ 2. ማንበብና መፃፍ 3. 1-6 ክፍል 4. 7-12 ክፍል 5. ከ12 ኛ በላይ	
108	የልጁ የትምህርት ደረጃ	..... ክፍል	
109	የቤተሰብ ወርሃዊ ገቢ	..... ብር	
ክፍል 2 የህፃናት የአመጋገብ ልማድ መረጃ			
201	ልጅዎትን በቀን ስንት ጊዜ ይመግባሉ	1. በቀን አንድ ጊዜ 2. በቀን ሁለት ጊዜ 3. በቀን ሦስት ጊዜ	

		4. በቀን አራት ጊዜና ከዚያ በላይ	
202	ለልጅዎት አዘውትረው የሚሰጡት የቁርስ አይነት ምንድን ነው	1. ሻሂ በዳቦ 2. ወተት በዳቦ 3. እንጀራ በወጥ(ፍርፍር) 4. ቅንጨ 5. ገንፎ 6. ሌላ ካለ ይገለፅ……	
203	በአለፈው አንድ ወር ለልጅዎት አዘውትረው የሚሰጡት የምሳ አይነት ምንድን ነው	1. ሻሂ በዳቦ 2. ወተት በዳቦ 3. እንጀራ በወጥ(ፍርፍር) 4. ቅንጨ 5. ገንፎ 6. ሌላ ካለ ይገለፅ……	
204	በአለፈው አንድ ወር ለልጅዎት አዘውትረው የሚሰጡት የራት አይነት ምንድን ነው	1. ሻሂ በዳቦ 2. ወተት በዳቦ 3. እንጀራ በወጥ(ፍርፍር) 4. ቅንጨ 5. ገንፎ 6. ሌላ ካለ ይገለፅ……	
205	ለልጅዎት መክሰስ በቀን ስንት ጊዜ ይሰጡታል	1. በቀን አንድ ጊዜ 2. በቀን ሁለት ጊዜ 3. አልፎ አልፎ 4. ምንም አልሰጠውም	
206	ልጅዎት ሻሂ በስኳር ይጠጣል	1. አዎ 2. አይደለም	
207	ለጥያቄ 206 መልስ አዎ ከሆነ በቀን ስንት ኩባያ ይጠጣል	……	
208	ልጅዎት ቡና በስኳር ይጠጣል	1. አዎ 2. አይደለም	
209	ለጥያቄ 208 መልስ አዎ ከሆነ በቀን ስንት ስኒ ይጠጣል	……	
210	ልጅዎት ለስላሳ መጠጦች ይወስዳል	1. አዎ 2. አይደለም	
211	ለጥያቄ 210 መልስ አዎ ከሆነ በቀን ስንት ለስላሳ ይጠጣል	……	
212	ልጅዎት ጣፋጭምግቦችን ይወስዳል(ኬክ፣ማር፣ጆላቲ፣ብስኩት)	1. አዎ 2. አይደለም	
213	ለጥያቄ 212 መልስ አዎ ከሆነ በሳምንት ስንት ጊዜ ይወስዳል	1. በየቀኑ 2. በሳምንት አንድ ጊዜ 3. አልፎ አልፎ 4. ሌላ ካለ ይግለፁ…….	
ክፍል ሶስት ስለ ጥርስ መቦርቦርና መከላከያው ያለ ግንዛቤና ልምድ መረጃ			
301	ስለ ጥርስ መቦርቦር ከአሁን በፊት ሰምተው ያውቃሉ	1. አዎ 2. የለም	

302	ለጥያቄ 301 መልስ አዎ ከሆነ መረጃውን ያገኙት ከምንድን ነው	1. ከጤና ሙያተኛ 2. ቴሌቪዥን/ሬድዩ 3. መፅሄትና ጋዜጣ 4. ከዘመድና ጓደኛ 5. ሌላ ካለ ይግለፁ……	
303	ልጅዎት ከአሁን በፊት በጥርስ መቦርቦር/መበስበስ ታሞ ያውቃል	1. አዎ 2. አይደለም	
304	ለጥያቄ 303 መልስ አዎ ከሆነ የበሽታው ምልክት ምንድን ነበር	1. ከፍተኛ የህመም ስቃይ 2. መጥፎ የአፍ ጠረን 3. መድማት 4. እብጠት 5. ሌላ ካለ ይግለፁ…….	
305	ልጅዎትን ለህክምና የት ይወስዳሉ	1. ጤና ድርጅት 2. ፋርማሲ 3. ባህላዊ ህክምና 4. የትም አልሄድም 5. ሌላ ካለ ይገለፅ……	
306	ልጅዎት ጥርሱን ያጸዳል	1. አዎ 2. አይደለም	
307	ለጥያቄ 306 መልስ አዎ ከሆነ በቀን ስንት ጊዜ ያፀዳል	1. በቀን አንድ ጊዜ 2. በቀን ሁለት ጊዜ 3. አልፎ አልፎ	
308	ለጥያቄ 306 መልስ አይደለም ከሆነ ምክንያቱ ምንድን ነው	1. ጥቅሙን አላውቅም 2. ጊዜ የለኝም 3. የገንዘብ አጥረት 4. ሌላ ካለ ይገለፅ……	
309	ልጅዎት ከምግብ በኃላ አፉን ይጉመጠመጣል	1. አዎ 2. አይደለም	
310	የጥርስ ጤንነትን መደበኛ ክትትል ያስፈልገዋል ብለው ያምናሉ?	1. አዎ 2. አይደለም	
311	ለጥያቄ 310 መልስ አዎ ከሆነ ምክንያትዎ ምንድን ነው	1. የተቦረቦረ ጥርስ ካለ ለማረጋገጥ 2. የጥርስ ሕመምን ለመከላከል 3. ለጥሩ የአፍ ጤንነት 4. መጥፎ የአፍ ጠረንን ለመከላከል 5. ሌላ ካለ ይገለፅ……	
312	ለጥያቄ 310መልስ አዎ ከሆነ በየስንት ጊዜው ያደርጋሉ	1. በየስድስት ወር 2. በየአመቱ 3. አልፎ አልፎ 4. ሌላ ካለ ይገለፅ……	
313	ለጥያቄ 310 መልስ አይደለም ከሆነ ምክንያትዎ ምንድን ነው	1. አላውቅም 2. ገንዘብ የለኝም 3. ጊዜ የለኝም	

		4. እረሳለሁ 5. ልጄ ምንም ችግር የለበትም 6. ሌላ ካለ ይገለፅ……	
314	የልጅዎት ጥርስ በክር ይጠዳል?	1.አዎ 2.አይደለም	
315	የጥያቄ 314 መልስ አዎ ከሆነ በየስንት ጊዜው?	1. በቀን አንድ ጊዜ 2. በሳምንት አንድ ጊዜ 3. በወር ከ2-3 ጊዜ 4. ምን ን እደሆነ አላውቀውም	

ስለት-ብዙርዎት አመሰግናለሁ//

DECLARATION

I, the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health.

Name: Fenta Abebaw

Signature: ----------

Place of submission: School of Public Health, College of Medicine and Health Sciences, University of Gondar

Date of submission: ----------

This thesis work has been submitted for examination with my/our approval as University advisor(s).

Advisors

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